

GABRIEL et al.
Appl. No. 10/635,011
December 28, 2005

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (canceled)

2. (previously presented) Antenna arrangement comprising:

at least four antenna element systems each being at least one antenna element arranged offset with respect to one another, at least in the horizontal direction,

the at least four antenna element systems transmitting and receiving at least in one common polarization plane,

a network, via which the at least two antenna element systems can be supplied with a signal with an intensity or amplitude which can be adjusted relative to one another, said network including a differential phase shifter,

wherein the at least one network is arranged such that a different beam shape is used for receiving signals as compared to transmitting signals.

3-4 (canceled)

5. (Currently amended) Antenna arrangement according to claim 1, wherein the phase adjusting ~~element device~~ comprises a differential phase shifter.

6-8 (canceled)

9. (previously presented) Antenna arrangement comprising:

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at least four antenna element systems each having at least one antenna element, said elements being arranged to be offset with respect to one another, at least in the horizontal direction,

the at least four antenna element systems transmitting and receiving at least in one common polarization plane,

a network, via which the at least four antenna element systems can be supplied with signals with an intensity or amplitude which can be adjusted relative to one another,

the network having a phase adjusting device connected to receive an input signal, said input signal being split into at least two output signals with the same intensities but with different phase angles, and

at least one hybrid circuit, via which the output signals are converted to hybrid output signals which are at relatively fixed predetermined phase angles with respect to one another and whose amplitudes differ from one another as a function of the different phase angles in the phase adjusting device,

the at least one hybrid circuit comprising at least four hybrid circuits combined to form a Butler matrix, via which a four-column antenna array can be fed, in which an input signal which can be supplied to the input of the phase shifter adjusting device is split into two phase output signals and in that each output of the phase adjusting device is connected to two inputs of the Butler matrix via a respective downstream branching or addition point.

10. (previously presented) Antenna arrangement comprising:

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at least four antenna element systems each having at least one antenna element, said elements being arranged to be offset with respect to one another, at least in the horizontal direction,

the at least four antenna element systems transmitting and receiving at least in one common polarization plane,

a network, via which the at least two antenna element systems can be supplied with signals with an intensity or amplitude which can be adjusted relative to one another,

the network having a phase adjusting device connected to receive an input signal, said input signal being split into two output signals with the same intensities but with different phase angles, and

at least one hybrid circuit, via which the output signals are converted to hybrid output signals which are at relatively fixed predetermined phase angles with respect to one another and whose amplitudes differ from one another as a function of the different phase angles in the phase adjusting device,

the at least one hybrid circuit comprising at least four hybrid circuits combined to form a Butler matrix, via which a four-column antenna array is fed, with a double or multiple phase shifter arrangement being provided, such that the input signal which can be supplied to the input of the network and hence to the phase shifter adjusting device can be divided into four phase shifter output signals, which can be supplied to the four inputs of the Butler matrix.

11. (Cancelled)

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12. (Currently amended) Antenna arrangement according to claim 19, wherein the antenna elements are arranged in front of a common reflector arrangement.

13. (Currently amended) Antenna arrangement according to claim 19, wherein the antenna arrangement has antenna elements which transmit and receive in one polarization.

14. (Currently amended) Antenna arrangement according to claim 19, wherein at least two antenna elements are provided and transmit and receive partially in one polarization and partially in a second polarization plane, which is at right angles to the first polarization.

15. (Currently amended) Antenna arrangement according to claim 19, wherein dual-polarized antenna elements are aligned at $+45^\circ$ and -45° to the horizontal.

16. (Currently amended) Antenna arrangement according to claim 19, wherein antenna elements are provided which transmit and receive in only one frequency band.

17. (Currently amended) Antenna arrangement according to claim 19, wherein two or more antenna elements are provided which transmit and receive in at least two frequency bands, preferably in at least two polarization planes.

18. (Currently amended) Antenna arrangement according to claim 19, wherein the connecting lines between the outputs of the hybrid circuit and the inputs of the antenna arrangement can be interchanged to produce different horizontal polar diagrams.

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19. (previously presented) Antenna arrangement according to claim 9, including a connecting line between the outputs of the network in the form of said hybrid circuits and wherein at least some of the inputs of the antenna arrangement are of different lengths.

20-21 (canceled)

22. (Currently amended) Antenna arrangement according to claim ~~19~~, wherein the beam shape is adjusted variably.

23-24 (canceled)

25. (Currently amended) Method according to Claim ~~24~~26, including producing, during transmission, a horizontal polar diagram which overlaps the horizontal polar diagram which is produced for reception, with the horizontal polar diagram for transmission having a surface area with a lower power density.

26. (Currently amended) Method according to claim ~~23~~29, further comprising using a network which has a receiving network and a transmitting network, for setting a horizontal polar diagram which is different for transmission and reception.

27-28 (canceled)

29. (Previously amended) Method for operating an antenna arrangement, comprising:

varying an input signal via (i) either a phase adjusting device or a phase shifter adjusting device and (ii) a downstream network, such that the signals at the output of the network are either in phase or are not in phase, where the signals are input into antenna element systems to control the shape of the horizontal radiation pattern,

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said radiation pattern having at least three main lobes or an odd number of main lobes, whose maximum intensities differ from one another by less than 50%,

further including using at least four hybrid circuits, via which a four-column antenna array is fed, and

further including tapping off two phase shifter output signals at the two outputs of a phase shifter adjusting device, and supplying four resulting signals to four inputs of a Butler matrix.

30. (Currently amended) Method according to claim ~~23~~29, further including using a double phase shifter arrangement, at whose four outputs four output signals are produced which are supplied to the four inputs of a Butler matrix.

31-33 (canceled)